In the Claims

- 1. (Currently Amended) A method for quantifying a weight percent methane of a fluid downhole in a real time in a wellbore environment, comprising: obtaining the fluid downhole; measuring a first optical density for the fluid at a first wavelength region associated with a methane peak; measuring a second optical density for the fluid at a second wavelength region associated with the methane peak; and determining weight percent methane for the fluid sample from the first and second measured optical densities.
- 2. (Original) The method of claim 1, wherein the first wavelength region has a center wavelength of 1670 nanometers; and the second wavelength has a center wavelength of 1682 nanometers.
- 3. (Original) The method of claim 1, further comprising: correlating weight percent methane with optical absorbance at the first and second wavelengths.
- 4. (Original) The method of claim 3, further comprising: correlating pressure.
- 5. (Original) The method of claim 3, further comprising: correlating temperature.
- 6. (Original) The method of claim 1 further comprising: determining a gas oil ratio for the sample based on the weight percent methane.
- 7. (Original) The method of claim 1, further comprising:

monitoring sample cleanup based on a change in weight percent methane.

- 8. (Original) The method of claim 3, further comprising: correlating based on synthetic mixtures of methane and dead crude oils.
- 9. (Original) The method of claim 1, further comprising: filtering an optical density measurement with a 11 nm full width half maximum filter.
- (Original) The method of claim 1, wherein the first wavelength region has 10. a center wavelength of 1670 nanometers and the second wavelength has a center wavelength of 1682 nanometers; correlating weight percent methane, pressure and temperature with optical absorbance at the first and second wavelength regions; and determining a gas oil ratio based on the weight percent methane.
 - (Currently Amended) An apparatus for quantifying the weight percent of 11. methane in real-time in a wellbore environment, comprising: a tool for obtaining a fluid downhole; a spectrometer for measuring a first optical density for the fluid at a first wavelength region associated with a methane peak and measuring a second optical density for the fluid at a second wavelength region associated with the methane peak; and a processor function for determining weight percent methane for the fluid sample from the first and second measured optical densities.
 - 12. (Original) The apparatus of claim 11, wherein the first wavelength region has a center wavelength of 1670 nanometers; and the second wavelength has a center wavelength of 1682 nanometers.

- 13. (Original) The apparatus of claim 11, further comprising: a processor function for correlating weight percent methane with optical absorbance at the first and second wavelengths.
- 14. (Original) The apparatus of claim 13, the processor function further comprising a function for correlating pressure.
- 15. (Original) The method of claim 3, the processor function further comprising a function for correlating temperature.
- 16. (Original) The apparatus of claim 11 further comprising: a processor function for determining a gas oil ratio for the sample based on the weight percent methane.
- 17. (Original) The apparatus of claim 11, further comprising: a processor function for monitoring sample cleanup based on a change in weight percent methane.
- 18. (Original) The apparatus of claim 13, the processor function further comprising a function for correlating based on synthetic mixtures of methane and dead crude oils.
- 19. (Original) The method of claim 11, further comprising: a filter for filtering an optical density measurement with a 11 nm full width half maximum filter.
- 20. (Original) The apparatus of claim 11, wherein the first wavelength region has a center wavelength of 1670 nanometers and the second wavelength has a center wavelength of 1682 nanometers, the processor function further comprising a function for correlating weight percent methane, pressure and temperature with optical absorbance at the first and second

wavelength regions and a function for determining a gas oil ratio based on the weight percent methane.

- 21. (Currently Amended) A computer readable medium in a computer containing executable instructions that when executed by a computer perform a method for quantifying the weight percent of methane in real time in a wellbore environment, comprising: obtaining a fluid downhole; measuring a first optical density for the fluid at a first wavelength region associated with a methane peak; measuring a second optical density for the fluid at a second wavelength region associated with the methane peak; and determining weight percent methane for the fluid sample from the first and second measured optical densities.
- 22. (Original) The medium of claim 21, wherein the first wavelength region has a center wavelength of 1670 nanometers; and the second wavelength has a center wavelength of 1682 nanometers.
- 23. (Original) The medium of claim 21, further comprising: correlating weight percent methane with optical absorbance at the first and second wavelengths.
- 24. (Original) The medium of claim 23, further comprising: correlating pressure.
- 25. (Original) The medium of claim 23, further comprising: correlating temperature.
- 26. (Original) The medium of claim 21 further comprising: determining a gas oil ratio for the sample based on the weight percent

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methane.

- (Original) The medium of claim 21, further comprising:
 monitoring sample cleanup based on a change in weight percent methane.
- 28. (Original) The medium of claim 23, further comprising: correlating based on synthetic mixtures of methane and dead crude oils.
- 29. (Original) The medium of claim 21, further comprising: filtering an optical density measurement with a 11 nm full width half maximum filter.
- 30. (Original) The medium of claim 21, wherein the first wavelength region has a center wavelength of 1670 nanometers and the second wavelength has a center wavelength of 1682 nanometers; correlating weight percent methane, pressure and temperature with optical absorbance at the first and second wavelength regions; and determining a gas oil ratio based on the weight percent methane.